

A NEW STREPSIPTEROUS PARASITE OF
MEMBRACIDAE

By W. DWIGHT PIERCE

The Strepsiptera are an order of insects seldom seen by the average collector, although they may be present in the very area collected. The females are larviform, and found only in the abdomens of other insects, with only a cephalothoracic disc protruding between the segments; while the males are winged, very erratic in flight, and seldom found.

They parasitize the primitive silver fish, grasshoppers, ants, bees, wasps, bugs, and leaf hoppers in various parts of the world.

As I have elsewhere stated, the Aleurodoptera, Coccoptera, Strepsiptera, and Cyclorrhaphous Diptera form an ordinal group, Pupariata, in which the last larval skin becomes a puparium in which pupation takes place. The head of the puparium becomes a lid, the cephalotheca, in the Strepsiptera and Diptera, which is pushed off on emergence.

The wing venation in the first three orders is very simple, with no cells or cross veins. In the Strepsiptera the most primitive forms have a short basal Costa; a marginal Subcosta; Radius 1 often broken near middle of wing, with one or two fragments of Radial Sector beyond; Media usually free from base and extending to margin, but often broken at middle, with Media 1 always free and anterior to the main stem; sometimes with loose fragments representing Media 2, 3, and 4; Cubitus free, but usually Cubitus 1, if present, does not reach the base; while Cubitus 2, if present, is complete; one, two or three Anal veins.

Although the Strepsiptera have been reported from numerous species of Homoptera of the superfamilies Fulgoroidea and Jassoidea, there is only one published record of parasitism of the Membracidae. Subramaniam in 1927 described *Indoxenos membraciphaga*, bred from *Otinotus pallescens* Distant, in Mysore State, India. This was placed in the Halictophagidae.

It is now my pleasure to describe the first American parasite of the Membracidae. Mr. Cedric R. Jordan, a graduate student at the Texas A. & M. College, is working on the biology and control of the three-cornered alfalfa hopper, *Spissistylus festinus* (Say) (*Stictocephalus f.* Say). He has found this leaf hopper parasitized at Curtis, Louisiana, and College Station, Texas.

The abdomen of this leaf hopper is small, triangular in cross section, and in most cases there is room for only one parasite, but there were four hosts with two visible parasites each, one with males, two with females, and one with a male and a female. But on dissection, the writer found in one host 2 females, and 3 male

puparia; in another a female and a larva. In the material sent for study 21 ♀ and 12 ♂ hoppers were parasitized by 37 visible parasites, or, as stated above, 41 parasites in all. These consisted of 18 ♂, 22 ♀, and one larva. In all but two hosts the parasites protruded from ventral segments; 1 ♀, 1 ♂ in 1st segment; 5 ♀, 4 ♂ in 2nd ventral; 1 ♀, 1 ♂ in 2nd dorsal; 11 ♀, 6 ♂ in 3rd ventral; 1 ♂ in 3rd dorsal; 4 ♀, 2 ♂ in 4th ventral; 3 ♂, 1 larva internal.

Most of the material was collected July 16, August 10, 11, and 28, 1950, at Curtis; and September 25, and 27 at College Station. The one mature male was obtained September 27.

The characters of this insect warrant description of a new genus in the family Halictophagidae. The wings of Halictophagidae all lack Cubitus 1 and some lack Cubitus 2. The species so far described have in no case more than 3 veins in the cubito-anal area. The new species has Cubitus 2 and 3 anal veins.

GENUS MEMBRACIXENOS, new genus.

Halictophagidae, with seven-jointed antennae, the third to seventh flabellately produced and covered with delicate sense organs; special sensory organ at base of flabellum of 4th segment; three-jointed tarsi. Head of male dorsally broadly excavate for pronotum, but ventrally not excavate. Wing (Figure 2), with surface covered by microtrichia; with basal Costa; marginal Subcosta; darkened area between Subcosta and Radius; detached Radial Sector, and detached Media 1; Media 2 complete; Cubitus 1 missing; Cubitus 2 complete; 1st Anal extending only to middle of wing; 2nd Anal and 3rd Anal detached at base. Abdomen beneath (Figure 4) with 7 chitinized sternal plates.

Type — *Membracixenos jordani*, new species.

Membracixenos jordani, new species

(Plate 2; Figures 1-8)

Parasite of the Membracid, *Spissistylus festinus* (Say). Type locality, College Station, Texas; paratype locality Curtis, Louisiana. Described from 1 male (holotype); fragments of another male, and an extracted male in poor condition; 4 male cephalothecae; 11 male puparia; 2 male pupae; 14 females (including allotype); 6 larvae; and many triungulinids; mounted upon 38 microscope slides, with additional material in 8 vials of alcohol.

Male measurements: length 1.94 mm.; breadth of head 0.573 mm.; length of head on center line 0.15 mm.; length of antennae 0.439 mm.; length of thorax 1.146 mm.; hind leg coxa 0.18 mm., femur 0.28 mm., tibia 0.30 mm., each tarsal joint 0.08 mm.; wing lateral expansion width 1.4325 mm., length from costa to apical margin 1.088 mm.; length of abdomen on side 0.955 mm.; oedeagus 0.114 mm.

Head (Plate 2; Figures 1, 6) transverse, laterally stalked, bearing eyes; much broader than thorax; anterior occipital margin slightly concave; genae diagonally retreating to eyes; antennae widely separated by the broader frontal process; dorsal base trapezoidally emarginate for reception of pronotum. Ventrally the unprotected mouth opening is in front of the middle of a sub-square darkened facial area; at the margins of which are set the short acute mandibles, and two-jointed maxillary palpi. The antennal joints terminate almost on an even line. Hofeneder's special sense organ can be seen indistinctly near the base of the flabellum of the 4th segment.

The pronotum is arched forward to fit into the emargination of the head; posteriorly it is biemarginate; laterally it is a very narrow band to the venter. The intersegmental skin between pronotum and mesonotum is broader than either segment. Mesonotum is a narrow ring band with diagonal pleural strips. The elytra or balancers are about as long as the width of the mesonotum. The metathoacic pattern is quite normal, with key-stone-shaped prescutum, scuti not in contact, scutellum semi-elliptic; postlumbium transverse; postscutellum rather short, about as wide as long. Tarsi (Figure 3) all 3-segmented; each arising distant from the apex of the preceding.

Although the type male, which was extracted from a puparium, does not show the oedeagus, this is distinct in another male, also extracted, but otherwise not in good condition. These specimens will be kept in alcohol. The terminal segment (Figure 5) is almost vertical, and the oedeagus is a simple twice bent tube, with very sharp apex. It is very much the shape of that of *Pseudoxenos neomexicanus*, but different from all of the described Halictidae.

EXPLANATION OF PLATE 2

Membracixenos jordani Pierce

1. Adult male body, dorsal view. Length 1.9 mm.
2. Wing of male: *A*—Anal veins; *C*—Costa; *Cu*—Cubitus; *M*—Media; *R*—Radius; *Rs*—Radial Sector; *Sc*—Subcosta.
3. Parts of legs: *a, b*—tarsus of fore leg; *c*—tibia and tarsus of middle leg; *c*—tibia and tarsus of middle leg; *d*—hind leg.
4. Venter of male abdomen.
5. Terminal segment of male, showing oedeagus.
6. Face of male.
7. Cephalotheca of male puparium; *Ant.*—antenna; *as*—antennal suture; *Clp*—clypeus; *E*—eye; *Ephy*—epipharynx; *es*—epistomal suture; *Ge*—gena; *Gn*—gnathocephalon; *hs*—hypostomal suture; *Md*—mandible; *Mth*—mouth; *Mx*—maxilla; *Oc*—occiput; *Of*—occipital foramen; *Pge*—postgena; *Poc*—postociput; *pos*—postoccipital suture; *Prt*—pariental; *Sg*—subgena; *Smt*—submentum; *Vx*—Vertex.
8. Cephalothorax of female.

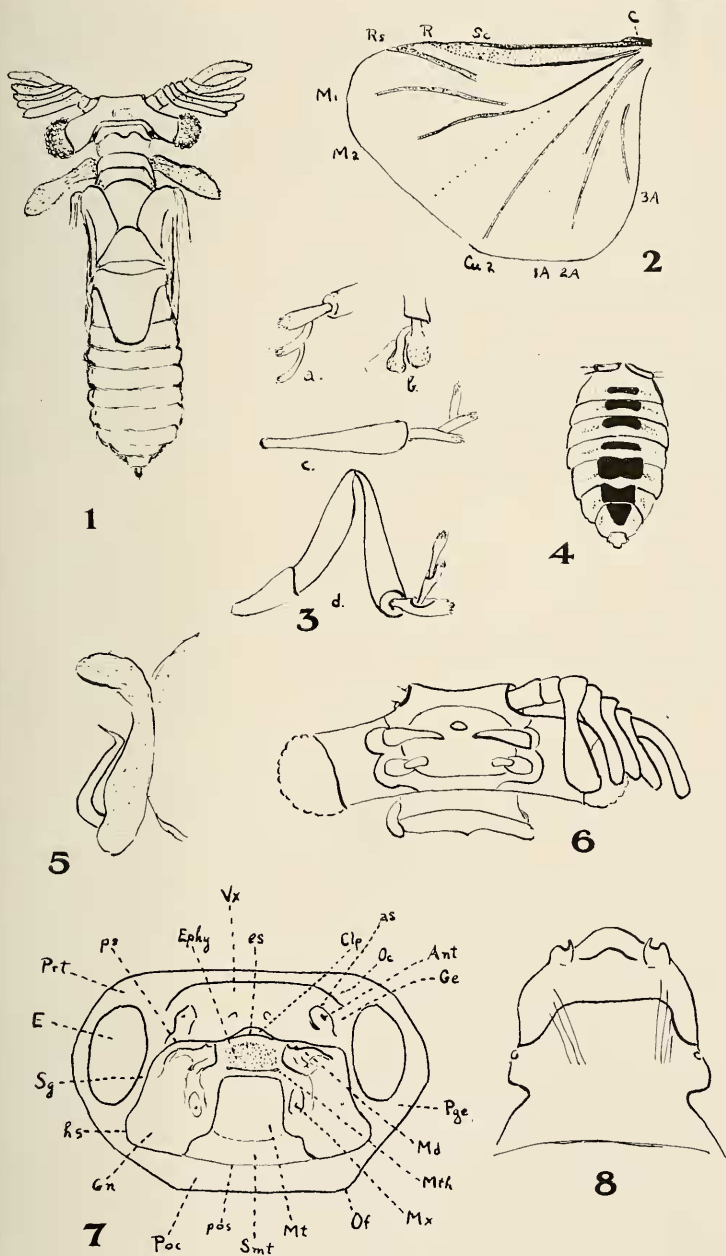


Plate 2

Male cephalotheca (Figure 7): breadth 0.668 mm.; length 0.4202 mm. In form somewhat similar to that of *Diozocera*, but with mentum more quadrate. The areas are designated in Figure 7. The mandibles are 2-toothed.

Female (Plate 2; Figure 8) cephalothorax 0.32 mm. long from apex to constriction behind spiracles; greatest breadth 0.42 mm. The body is a sac, which fits into the available space in the abdomen of the host. The cephalothorax is very different in form from that of *Indoxenos*, which is elongate, but is similar to that of *Diozocera*. The mandibles are armed in the inner apex with a curved tooth, and on the outer apical angle with a rounded tooth. They protrude beyond the anterior margin of the head. The outer angles of the base of the head are immediately in front of the cephalothoracic spiracles, as in *Indoxenos* and *Diozocera*, a character by which they differ very greatly from the Stylopidae.

Triungulinid: average length 0.191 mm.; width 0.0382 to 0.047 mm. wide; thus being as long as those of *Indoxenos*, but very much more slender.

